Interview with John Johnson

[Transcriptionist Notes: At times during the interview it was hard to hear and understand the Interviewer thus the inaudibles.]

R: I began working here at the Museum of Natural History in 1986. I have over the years studied various aspects of the pre-history and the cultural history of the Chumash Indians that lived in this part of California. And I studied Chumash Indians in all their aspects. I studied the archeology. I studied the information drive from interviews with Indians at the graphic information, and I studied certain amount of linguistic information about Chumash Indians. I studied their history and I studied their biological aspects, their genetics.

INT: Can you describe how the study of archeology, and archival records, and interviews, (inaudible) Chumash has allowed you to come to an understanding of what their culture was like particularly what it was like on the Channel Island, village there?

R: Well one of the things I've specialized in studying the mission records of the Indians who lived in this part of California and with regard to the Channel Islands I've looked at the names of the different Rancherias, as the Spanish called them, or villages where people lived. I tried to reconstruct (inaudible) as far as possible where those

locations are on the Channel Islands, how many people were living in each of the native towns, what their names were, who they married, what their marriage patterns were, how the villages interacted with each other, were their connection to their mainland's, you know, people who married or had relatives living on the other side of the channel, on the mainland. So I tried to study all aspects of the social organization of the island Chumash Indians.

INT: Let's talk about that for a minute. In a general sense maybe taking a single island so you don't have to credit back to everything what was the social organization of the island Chumash in a single village or island typically and how long ago was it that it was thriving?

R: Well there were about twenty occupied Chumash towns on the Northern Channel Islands. I've estimated running the estimate - - running - - let me start over again. There are about twenty Chumash towns on the Northern Channel Islands and I've ran the numbers to figure out what the original population was on the Channel Islands and several lines of evidence converged to tell us there were about - - excuse me, three thousand people living on the Northern Channel Islands at the time Europeans arrived. Now that's many more people that live there today. And, in face, when we look at the density of people living on the Channel Islands and compare that to the rest of California, (inaudible) California, what

we find out is that the highest population density in all of (inaudible) California was on the Northern Channel Islands. There were more people living per square mile on the Channel Islands than anywhere else.

The other thing that we can see is that there are different sizes of settlement on the Channel Islands. Some of the towns were quite large and had people who were identified as being Chiefs. Smaller towns don't have anyone identified as being Chiefs, and we know from at the graphic information that for Santa Cruz Island, for example, there were four chiefs on the island. There were ten town, ten native towns, but four chiefs and one of those chiefs was considered to be the paramount chief. He was chief of the whole island.

So, Santa Rosa Island probably the similar kind of situation existed there. We only have three times where people are identified as chiefs, but one of those is much larger than all the others. It's the town of (Shooksho) which was located on the eastern side of Santa Rose Island and it sounds like I'm sneezing, you know, (Shooksho). But, there was a large estuary at that location and lots of birds come into an estuary on the island there and (Shooksho) translated means lots of bird droppings, (Shooksho) means bird droppings so (Shooksho) means there's lot of bird droppings at that location and that was the name of the town there probably because of the large gatherings of birds that took place

there.

Well we know on the Channel Islands that people have been living there four thousands and thousands of years. So, it's difficult to say when a native town like (Shooksho) was originally established I presume that it's many centuries in the past. Certainly in that part of the island people have been living there for thousands of years, but when the actual town of (Shooksho) got established I don't think we can say at that point. There hasn't been enough archeological testing and radiocarbon dating to say when that particular native town was established. We do know that it was the largest settlement on Santa Rosa Island.

Also, the interesting thing about (Shooksho) is that there's a missionary who left us a record of four men at that native town that are identified as chiefs and one of them presumably was the Paramount Chief. But, the fact that there's one town with four people identified as chiefs is very interesting. It suggests that perhaps the town was actually a series of neighborhood, you know, kin groups that were headed by these different individuals who were the chiefs. And when you go out to that location there are a series of different archeological sites in that location. I don't think there were all, you know, - - in other words planted in one spot. There were different communities around that estuary and each one with a leader who was the head man. So that's our

understanding of how it may be - - may have been organized.

Now, we do know from archeological evidence there's a lot of fishing going on at that location. I mean that was the livelihood of all the people on the islands. They were fisherman and going out and fishing daily offshore in kelp beds. They were probably making plank canoes at (Shooksho). We know that the name of Santa Rosa Island in the Chumash language and the island Chumash language means driftwood, Wi'ma it means driftwood, so Driftwood Island. The redwood logs that would wash ashore there were then split up and used - - made into planks that would be sewn together to make the plank canoes or (comolt). And what's interesting is that the missionary at La Purisima Mission in the early 1800's is actually buying a plank canoe from the head chief at (Shooksho) that they can use at the mission for fishing for the mission. So it's showing that they are making the plank canoes there and also are - - that Santa Rosa Island may be - - is a center for plank canoe manufacturer because of the presence of all that driftwood.

INT: What kind of trading would go on between (Shooksho) and say other villages on the island, between those villages and other islands, or between (Shooksho) and the main land? Was there a necessity for the residence of (Shooksho) - - would trade with other entities and what did they - - what would they trade for and what did they use as currency? Did

they have the (inaudible) money?

R: Another activity that was going on at (Shooksho) and many of the other island towns is the manufacturer of Shelby money. There's a particular species of shell, the dwarf purple olive, Olivella biplicata, that is found in sandy areas around the Channel Island in great abundance. And if you go to (Shooksho) it's a sandy - - it's got a nice sandy beach and Skunk Point nearby is nothing but sand dunes and so this would have been a very good habitat for the purple olive and (inaudible) that shell was then used to manufacture beads that were like wampum. They were a medium of exchange, a currency, that the Indians of the Channel Islands would manufacturer - - the Channel Islands (with) a mint in other words that making this bead money that would be traded to the mainland for resources they didn't have out there on the islands. And then that bead money made originally on the Channel Islands was circulated widely throughout the Chumash region and beyond. Chumash bead money was used throughout the southern half of California. It was traded all the way into the American Southwest to the vicinity of Santa Fe on the Rio Grande River. So, Chumash bead money has been found in Pueblo sites, in other words, in the American Southwest, all manufactured on our Channel Islands.

INT: You nailed that one. John, what were they trading for? What did the people of (Shooksho) need in their village

in which they would pay Shelby's money either other island or even more likely to the main land (inaudible) islands would probably have the same need. The question is what were they trading for? What did they need to bring to the islands and pay for with their Shelby money?

R: Well there's a lot of resources not available to the people that lived on the Channel Islands. As rich and abundant as that marine environment was on the Channel Islands, you know, and allowed at a higher population density to exist there were still things they didn't have out there. And so, for example, some of the materials used to make basketry, you know, would not be as common on the Channel Islands and they would depend upon people on the mainland, you know, women who were specialists in basket weaving and made these fine baskets for which (inaudible) are famous, you know, they would have been traded to the people on the Channel Islands.

Another very important commodity was - - were nets, and fish line, and other things that were made from a plant called Dogbane or Indian Hemp that grows back in the mountains here on the mainland. And that was harvested and made into string and made into rope and cortege that would - - and into nets, and fish line, and so on and the rope that was used to tie the planks on the plank canoes together and that, kind of, thing would have been exported to people living on the island in

exchange for the bead money.

And there were also food (stuff) that weren't accessible on the island that would have been available on the mainland. For example there's no deer on the island if they wanted to taste deer meat. They had sea mammals. They hunted seals and fish and, of course, fish but they would - - might have traded deer meat, deer hides, you know, to the islands, fox skins although they had these little foxes on the islands. Fox skins were another trade item from the larger foxes on the mainland. Also, they would have - - maybe there were finished bows and arrows that would be traded to the people on the island, and acorns, and other kinds of (seed) crops that were not as abundant on the islands. Plant foods, in other words, that were more abundant on the mainland and would have helped supplement the diet of the islanders.

INT: Excellent, thorough response. Same village slightly different question, I mean different question, do we know about the spiritual beliefs to any extent of the folks in the village? Do we know what their mythology, their spiritual structure was? What type of ceremony of worshiping they might have done? If you do have any insight on that could you give us a general sense of the spiritual feelings and ceremonies in the village?

R: Well we know a little bit about Chumash ceremonial life and religious beliefs from elderly Indians that were

interviewed in the early twentieth century by the anthropologist John Harrington. The most important ceremony conducted throughout the year for Chumash Indians was the Winter Solstice ceremony and they believed that this was a very sacred time of year that the sun was reborn at this time of year. The days have been getting smaller, I mean shorter, and then at the time of the Winter Solstice, you know, the sun begins to grow again. And so it's the rebirth of the sun at the time of year, and there were ceremonies conducted.

We also know that there was another important ceremony in the fall, Harvest Ceremony, which they would - - after the seeds and other wild grains had been gathered, collected, there would be a ceremony to give thanks for this abundance that has taken place and a successful harvest. Let's see? Chumash Indians believed that all of the creatures of the sea had their counterparts on land. You know just like - - well the gopher snake on land was the counter part of the barracuda in the sea, and the Jerusalem cricket, you know, this little potato bug that's in your gardens that counterpart was the lobster in the ocean, and lizards had their counterpart in sardines that were very abundant around the Channel Islands. But, the counterpart of human beings was the swordfish and the swordfish was the chief of all the creatures of the sea. And so the island Chumash had a dance, the swordfish dance, which was performed. There was swordfish shamanism in Chumash

society. There was a headdress that they said belonged to the chiefs that was made from these craniums, the skull of the swordfish, with the sword above it.

And, Swordfish are a very difficult fish to capture of course but we find swordfish remains in Chumash (society). So they were - - because they had this wonderful water craft, the plank canoe, they were able to successfully spear and capture swordfish from time to time. It was probably a great achievement when that happened and that's one of the reasons why the swordfish had such a high status.

The other interesting thing is the Chumash believed that the swordfish was responsible for driving whales to shore when whales would wash up onshore and beach which happened from time to time - - that that was caused by swordfish driving them ashore and that was feast time, of course. Whenever a whale would wash ashore we find whales bones in all the Chumash sites. Chumash were not whale hunters but they would take advantage of these beached animals, you know, for food and for the bones that were used for making tools and so on. And what's interesting is that whales really are attacked by swordfish. There is biological literature that shows that broken off swords have been found in whales worldwide, you know, so swordfish do attack whales from time to time. So this Chumash myth was not really a myth it was based on their direct observations of nature.

INT: Fascinating.

R: Yeah.

INT: Are you done with that? Would you like to go on to - - ?

R: I can go on to (inaudible).

INT: That was fascinating.

R: Okay.

INT: Can you explain the Rainbow Bridge (inaudible) why that was (inaudible) and why it was necessary?

R: John Harrington who's the anthropologist that interviewed elderly Chumash Indians recorded from (Luicig Darcio) who was an old Indian women living here in Santa Barbara in the late twentieth century he recorded from her the story that all the people on the mainland, it was the ancient Chumash belief, that all the people in the mainland had originated from the Channel Islands. They didn't (inaudible) their headband on migration on people from the islands to the mainland in that resolve they didn't - - you know people who spoke Chumash languages.

Now, there's also a myth about a Rainbow Bridge coming from the island to the mainland and that the people from the island travelled to them mainland over that Rainbow Bridge ending up at a mountain peak back of Carpentaria. It's called (Chisma Hoot). It still has a Chumash name to this day. And the rainbow came over from the islands to (Chisma Hoot) and

that's the way that the people crossed over from the islands to the mainland.

INT: Thank you.

R: Now, I want to say also that we wish we had better documentation for this Rainbow Bridge myth. We know that the person who told the story wrote it up for an article in the Santa Barbara news press in the 1950's or 60's But he says that he heard it from an elderly Chumash Indian actually the son of (Louisa Ignacio) who had been interviewed by Harrington. However, we've never found that legend in John Harrington's notes which are aluminous. For some reason we don't find that particular story about the Rainbow Bridge myth in his papers. So, you know, what is the reason for this? Maybe the story has been embellished over time. I feel a lot better about that particular myth if we had an original version that we could find in Harrington's papers but so far nothing has come to light.

INT: Was there an aspect (inaudible) fell off on the way over the Rainbow he would turn into a dolphin or am I just hearing that - - ?

R: Yeah the story as it was related - - well I would feel better about the rainbow bridge story if (Louisa Ignacio) had mentioned a Rainbow Bridge in that note that I've seen from John Harrington. She does - - she says that the people from the islands came to the mainland just like on a foggy day, the

fog moves from the ocean to the mainland, that was the analogy which she used. But she doesn't talk about a Rainbow Bridge in that original note that I've seen. It isn't until almost forty years later that we see this story being recorded secondhand from someone who says he heard it from an elderly Chumash man, the son of (Louisa Ignacio) in fact. It may be really true. I just would feel better about it had I seen it in John Harrington's papers.

Now, one aspect of the Rainbow Bridge story is that the people who were coming over the Rainbow Bridge to the mainland were not supposed to look down as they came over the Rainbow Bridge but some did anyway and fell off and rather than drowning the mother earth changed them into dolphins and that's where the dolphins originate - - are the people who fell off the Rainbow Bridge.

INT: Thank you. Let's go to the language question relating (inaudible)?

R: Okay, the Chumash had a word that is translated in early - - okay, excuse, let's start over.

INT: What do we want them to (inaudible)? Start over please and just look at me.

R: Okay. Well the Chumash had a word that translated it can mean, "Earth". It can mean, "World". It can mean, "God." In fact, there's several early vocabularies where Chumash Indians when asked to supply the word - - equivalent word for

"God" use this word, "(Chup)" so ""Chup" means - - I don't know universal spirit I think or mother earth - - it would be another way of looking at it. So this was mentioned in early missionary documents too is they were trying to stamp out this worship of "Chup" among the Chumash and that Chumash would have shrines set up near their towns where their offerings would be made in honor of "Chup".

So, in terms of, the Rainbow Bridge story, you know, "Chup" didn't want the people who fell off the Rainbow Bridge to drown and so they were changed into dolphins and that's where dolphins came from, the souls that fell off the Rainbow Bridge.

INT: Great. That was beautifully done, really. Really beautifully done. Back to Island trade for a second and language. There different languages spoken by different villages even and certainly different islands.

R: Right.

INT: Do you have ideas and insights that you wanted to mention about language and the impact of language. So I won't ask you a question, I'll ask you to deliver it please.

R: Okay, well, the name Chumash as it is currently used by anthropologists is actually referring to people who speak any one of six different languages that were related to each other. Chumash actually refers to a family of Indian languages in other words. Now, the original name "Chumash"

was the term that the mainland Indians used to refer to the people of the Channel Islands. So the original Chumash were just those people who lived on the Channel Islands, not the people on the mainland. Today we use it to refer to all these people speaking these related languages and actually the island Chumash language was not mutually intelligible with that spoken on the mainland.

We know that there were ceremonies conducted in the early 1800's at Mission San Buenaventura in which they would have to have a translator from the islands translate into the Ventureno Chumash language. The ceremony was taking place at Ventura and because they couldn't understand each other. Now, it's interesting when you look at the mission records and look at island Indians who are being baptized at the missions there's certain men who are living in mainland coastal towns. In other words they've married across the channel, married women who are living in mainland coastal towns along the Santa Barbara Channel, and they are serving as the translators, in other words, when trade takes place between the islands and the mainland because the two languages although related were not mutually intelligible. It would be like English and Dutch. They're related languages, both Germanic languages, but not mutually intelligible.

INT: A brief answer on this one. Can it be assumed that life on the other seven Channel Islands was more or less

comparable to Santa Rosa and the Village of (Shooksho)? Is that a fair assumption five hundred, a thousand, two/three thousand years ago? Is there a radical difference or (inaudible)?

R: Life on the different Channel Islands was probably pretty similar between villages on different islands. There were, you know, ten towns on Santa Cruz Island. There were seven or eight on Santa Rosa and there was one or two on San Miguel Island. So depending on the size of the island they'd be fewer people. So the largest Island Santa Cruz had the most people.

INT: And what do we know about San Clemente, Santa Catalina, San Nicholas can you make the same assumption, somewhat comparable?

R: Well, in my opinion, there were not as many people living on the southern Channel Islands as were living on the Northern Channel Islands. The Southern Islands didn't have the kelp beds that were present in the Northern Channel Islands and the kelp beds are rich habitat for fish. The water's much warmer on the Southern Channel Islands. Now there are kelp beds down there but not as productive as the ones on the Northern Channel Islands. And, so also some of the species - - well I should take this back because I don't - - I'm not - - .

INT: Okay.

R: I'm not exactly - - I'm thinking of snorkeling off of San Clemente Island and kelp beds.

INT: Right.

R: Let me go back. What I wanted to say, okay.

INT: Yes?

R: I was getting mixed up here.

INT: (Inaudible)?

R: Okay, yeah. The Northern Channel Islands is where Chumash Indians lived. Now, the Southern Channel Islands, San Nicholas Islands, Santa Catalina Islands, San Clemente Island were inhabited by people speaking a dialect of the (Cabrolin) or (Tonga) language which is spoken in Las Angeles basin area in Southern California. It's completely unrelated to the Chumash languages and the population density on those islands I feel was not as great as what was present on the Northern Channel Islands. The Northern Channel Islands have a cooler sea temperature around those islands and they're more productive, in terms of, marine resources. For example, if you walk around Santa Catalina Island you'll find that there's no shell middens - - have any muscle shell in them at all. You know muscles, you know, are an important meat source for the Chumash Indians on the Northern Channel Islands, but they're completely lacking on the Southern Channel Islands. And ninety-eight percent of the shell in the middens on Santa Cruz Island, for example, are muscle, you know, because muscle

is such an important resource. So the Northern Channel Island supported more - - many more people than did the Southern Islands.

INT: Excellent, thank you. Let's move now - - .

R: There may have been for example - - let's just take for an example.

INT: Go ahead. I'm listening.

R: Let's just take for example San Nicolas Island. I think a reasonable estimate for the number of people in total on San Nicholas Island was only about three hundred people at any one time. Now you can ask Steve Schwartz about this but I think he would concur with that whereas on Santa Cruz Island, you know, there were probably more than a thousand people.

INT: Well let's say that - - .

R: Maybe fifteen hundred even.

INT: Let's just start again. "I think a reasonable estimate for example on San Nicolas Island - - ."

R: Okay.

INT: Let's have you give (inaudible).

R: I'm not sure I'm prepared to talk about either San Clemente or Santa Catalina.

INT: Okay.

R: I don't have a good estimate.

INT: Whatever you want.

R: Yeah. Our estimate for the number of people on the

Channel Islands at the time Europeans first contacted the Islanders is around three thousand people on the Northern Channel Islands, maybe about fifteen hundred of those or more were on Santa Cruz Island, just Santa Cruz Island in it of itself.

Now, let's compare that to one of the Southern Channel Islands, San Nicholas Island. It's smaller than Santa Cruz Island but our best guess about how many people were out there is about three hundred people. So there's far lower population density on the Southern Islands compared to the Northern Islands.

One of the interesting things is that the Chumash word for bead money is, (Ulchum) or (Onchum) depending on which Chumash language you're talking about and the name Chumash is apparently etymologically related to the word for bead money. In other words the mainland Indians were referring to those people on the Channel Islands as Chumash because they were bead money makers. We have some bead money right here in fact. This is some bead money from the mission period actually. And the reason why we can tell that is because the whole diameter in the beads is small therefore they were not using stone drills to drill the beads, but they were using metal needles that they had traded from the Spanish in order to perforate the beads.

This is one of the ways we can tell when a village was

occupied. If we find these needle drill beads we know that that is a village that was occupied during mission times. The first European contact with the islanders occurred in 1542 when Juan Rodriguez Cobrio with his several ships came up and - - exploring the California coast. This is at the same period of time that Coronado is exploring the American Southwest that the - - I'm drawing a blank here. Excuse me. Well maybe I shouldn't get into that.

INT: That's fine. Start over.

R: Okay.

INT: You don't have to get into that. You can just start with - - .

R: At the same time - - .

INT: (Inaudible)?

R: No the Southeast was being explored by - - all of a sudden I'm - - .

INT: (Inaudible)?

R: No it was after him.

INT: (Inaudible). [Giggling.]

R: No. All of sudden I'm drawing a blank. Who's the fellow in - - .

INT: (Inaudible)?

R: No Southeast.

INT: Oh Southeast?

R: They were visiting on the mountains and fighting with

the Indians. It was Desoto.

INT: Desoto.

R: Yeah, okay. [Giggling.] Alright.

INT: Alright so you know the question. The question is the story (inaudible).

R: So the Spanish Viceroy - - .

INT: (Inaudible) when you're ready.

R: The Spanish Viceroy and the Spanish Crown were interested in what lay north of Central Mexico and so we find there's a whole series of expeditions in the sixteenth century, you know, Disoto in the American Southeast, Coronado in the American Southwest and Cabrio along the California Coast. Cabrio was sent northward with his ships, the Son Sebastian and the Victory, to explore the California coast. He is the first one to make contact with the island Indians. He visited Catalina Island which he named after his flagship, San Sebastian. He visited San Clemente Island which he named after his other ship, Victoria. And he visited the Northern Channel Islands where Chumash Indians lived. And he leaves us a list of names of the native towns on the islands and on the mainland too as well. It's a wonderful early record of which Chumash towns were inhabited at that time.

Later on in 1602 the explorer Sebastian Viscaino came up the California coast and the reason why we're called Santa Barbara today is because Viscaino was in the Santa Barbara

Channel on December 4th, 1602, Saint Barbara's Day, so he named us Santa Barbara and that's why this name is still surviving today for our area.

Viscaino described the people of the different Channel Island. He visited Santa Catalina Island. He visited Santa Cruz Island. And there's an interesting map that survives from Viscaino voyage where he calls the people of Santa Cruz Island, he calls it, "The Island of the Bearded Men." So he encountered Indians wearing beards and this was interesting enough to him that they actually put this, you know, down on record.

Later on there was very little contact with Island Indians and Spanish explorers. There was one explorer Sir Mano who arrived in Northern California and anchored at Drakes Bay and there was a storm that came up and actually wrecked his ship. And his crew then made their way south in the ships launch and they left a record of their (inaudible). They visited, for example, off of Santa Rosa Island several Indians in a Chumash plank canoe came out and traded fish with them and they got some food. Later on they ended up on an island we think it's Santa Catalina and, again, there was some kind of beach marine mammal or fish that was very large that they were able to get more food so they didn't starve. They eventually made their way all the way down to the West coast of Mexico where they could tell their story. There's really very little contact

during that period of time between the islanders and the Spanish after Cabrio and Viscaino.

It wasn't until the push northward from Baha, California, to establish the first missions in Alta, California, that the islanders really began to interact with Spanish on a fairly regular basis. The Portola expedition in 1769 came, you know, into the Santa Barbara Channel area after working their way up from San Diego and when they got to Ventura, for example, they said several canoes from Ventura went out to the islanders to bring over people from the Channel Islands to meet the explorers there in Ventura. They looked at the islands off the coast. They even - - the explorers left sketches of those islands. But the really great impacts to the island Indians didn't incur until after missions had actually begun to be established.

The first island person to be baptized was in the early years of San Buenaventura which was founded in 1782. And there's one person who's baptized, for example, who says her father was a deceased chief from Santa Cruz island and they - - but there was - - really they're not too many islanders who were baptized at the missions for a long time. The islanders were left alone and the viceroy in Mexico even wrote a letter to (Hernibo Sara) who was the founder of the Californian missions instructing him to leave the Indians of the islands alone, not to try to bring them to the mainland.

And there was an interest that the Spanish (inaudible) had in doing this because they didn't want other foreign ships to seek refuge on the island and as long as the islands were inhabited, you know, then they wouldn't be as likely for others to come there and use it as a base of operations to attack the Spanish settlements on the mainland.

The (inaudible) Indians population began to decline though as a result of introducing European diseases. At one point during the mission period there was a plan to put a mission on Santa Cruz island at Prisoners Harbor and the missionary, you know, made this proposal in a report he did at the end of the year in 1803 and he said that about that time there was maybe about a thousand eight hundred Indians on the Channel Islands. There probably been a decline, in other words, up to that point.

However, two years later or three years later in 1806 there was a very severe epidemic that really reaped havoc all up and down California. It was a measles epidemic, and Californian Indians had no resistance to measles. And the missionary then wrote a few years later after he made this initial proposal putting a mission on Santa Cruz Island that the impact on the Island Indians from this epidemic had taken maybe a quarter of the lives of the people on the Island. And there was no longer - - seemed advisable to put a mission there because there weren't enough people, you know, to

support a mission. Still the Indians remained for the most part living in their native towns on the Channel Islands. It wasn't until 1815/1816 that we get really (inaudible) of all the people on the islands coming to the mainland in that year. And the last islanders were baptized in 1822.

In the past before Europeans arrived the people of the islands had this trading system where they could trade bead money, other resources, to mainlanders in exchange for things they didn't have on the islands. Especially this would have been important in years when there were severe El Niño events because during an El Nino the kelp beds die back and the kelp bed is where the Island Indians are doing all their fishing. It's where most of their fish are coming from, from the kelp beds around the island. If the kelp beds died back there's - - the fish go elsewhere. They aren't able to survive except trade would have helped them buffer those periodic shortages that would have occurred during El Nino events. And this is one of the reasons why they developed this bead money economy is they could then as a form of, sort of, stored value so they could trade the bead money for resources during lean years to the people on the mainland now this all changes during the mission times.

The mainland Indians by 1803/1804 are pretty much all resettled at the missions. La Premisia, Santa Barbara and then Santa (inaudible), and San Buenaventura and so the old

trading partners that the Island Indians used to have in these mainland coastal towns are now at the missions. So what happens? In 1815/1816 there's a very severe El Nino event that occurs, and we know this from records that are kept down in Peru that a very warm water - - in fact maybe the most severe El Nino event in recorded history, you know, occurred during that year. And as a result the missionary at San Buenaventura says their famine conditions on the Channel Islands in that year and all of sudden we see this migration of the last people living on the islands coming to the missions and they distributed themselves geographically. The people at San Miguel Island and Eastern Santa Rose Island go to La Premisia. The people on - - excuse me, Western Santa Rosa Island - - people of Eastern Santa Rosa Island, the West Coast of Santa Cruz Island go to (inaudible). The people in the Central part of Santa Cruz Island go to Santa Barbara, and the people of Eastern Santa Cruz Island go to Santa Buenaventura all in 1815/1816. The islands are virtually empty after that date although there were a few hold outs that stayed there as long - - until 1822.

INT: Excellent. I think we need to get to (inaudible) pretty soon.

R: One thing I could say is about the fact that there are people, our neighbors, friends, citizens today who are descendent from people of the Channel Islands. Is that - - ?

INT: Yes.

R: I mean do you want me to mention that or are you going to have Julie - - she'll be an example of that, I mean.

INT: Yeah.

R: Well there are - - I'll - - what's going on at the Southern Channel Islands is a little bit different than what's going on in the Northern Channel Islands. For one thing not as many of the Indians from Santa Catalina and San Clemente ended up at missions as was the case on the Northern Channel Islands. So we don't have records of a lot of those people. The mission records, in other words, are not as good of an index in estimating population for the Southern Islands. What seems to have occurred on the Southern Channel Islands is that people went and moved to the mainland. Some of them settled in the Pueblo of Las Angeles and were working as servants and laborers for the different (inaudible) of Los Angeles on the different ranches that were in Los Angeles based (in there) and opted out of the mission system entirely. We do find some of their children being baptized, you know, but the parents never - - their names are mentioned, their Indian names are mentioned, but they never end up at the mission.

So actually then in 1824 I think it is that the Plaza Church is founded in Las Angeles to serve the citizens of Los Angeles. And then we begin to get a few of the Southern Islanders being baptized and appearing in the Plaza Church for

records in 1820's. This doesn't - - they were from San Clemente, Santa Catalina. This doesn't mean that they were - - they had been living on the islands. They had actually moved to the mainland and were working - - workers on - - in the vicinity of Los Angeles.

Now, in 1835 I think it is there's a small group of Islanders that show up in the Plaza Church records and what we recently determined, myself and some other researchers, is that that group of Indians came from San Nicholas island. They were the last group that had been living on San Nicholas island - - the last group of Islanders on any of the islands. There was maybe a group of about four, or five, or six people on San Nicholas Island remaining there and that group came to the mainland, some of them were baptized, the one woman who remained alone on that island was there until 1853.

Well the Island Indians after they became baptized at the different missions formed little enclaves at each mission where over time the islanders would intermarry with the people from the mainland Chumash towns that had - - that come associated with the mission and so you get this intermarriage taken place. There are actually many people alive today that we can trace through time using the mission and church records from ancestors who came up on the Channel Islands and some of those people live in Ventura, some of them live in Santa Barbara, some of them live at San (inaudible) reservation.

There are living descendants today from all of the Northern Channel Islands and there are descendants we can trace to both San Clemente and Santa Catalina Island as well because of existence of these mission records. Now - - is that it? [Giggling.]

INT: Sure.

R: Okay.

INT: It worked for me. Let's talk about (inaudible).

R: Okay.

INT: This is really the, you know, the payoff for you and (inaudible) I think.

R: Right.

INT: And also for the viewer. Whenever we tell anybody (inaudible).

R: And is it Dave?

INT: David.

R: Yeah he was here when we thought it was a woman. [Giggling].

INT: Oh you were? Then we should probably interview you. [Giggling.]

R: We used to think it was a - - well for a time there we thought it was (inaudible) belonged to a women. We're now thinking that's - - we've gone back on that.

INT: Well should we just go (inaudible)? So we'll just run through a bunch of these questions and you feel free as you

have all morning (inaudible) give it back the way you want. I'll start with just the basic. Please tell the story of the discovery of Arlington Spring by Mr. Orr and then your own (inaudible) that yield with the more complete understanding of it so.

R: Our curator of anthropology here at the Santa Barbara Museum of Natural History during the 1940's and 1950's and up to 1960's was Phil Orr. Phil Orr did a lot of his research on Santa Rosa Island. He spent years of research, in fact on Santa Rosa Island conducting both paleontological and archeological studies. One of the interesting research questions he was pursing was the story of the pygmy mammoth on Santa Rosa Island and he was excavating a lot of pygmy mammoth bones and reconstructed a skeleton of a pygmy mammoth as a museum exhibit.

In 1959 he was in Arlington Canyon at a location called, Arlington Springs where there are springs that come out of the side of the canyon and he discovered buried thirty seven feet below the existing ground surface exposed in the side wall of the canyon a human femur, in fact, it turned out there were two human thigh bones sticking out of the side wall of Arlington Canyon in the same formation where he was finding pygmy mammoth bones. And he realized he had a very important world class discovery that had been made demonstrating people were here about the same time pygmy mammoths were here at the end of the

ice age.

Phil Orr was the curator of anthropology and paleontology here at our museum in the 1940's/1950's/1960's. He did a lot of research on Santa Rosa Island studying the prehistory of Santa Rosa Island and the paleontology of Santa Rosa Island. Phil was especially interested in pygmy mammoths and did a lot of research on the pygmy mammoths of the Channel Islands. There was this species of mammoth that evolved into a dwarf species on the island and in 1959 Phil Orr was in Arlington Canyon and through an accidental discovery noticed that there was a human femur protruding from the side wall of Arlington Canyon thirty seven feet below the existing ground surface. He recognized that those sediments were dating to the end of the ice age and were found in the same formation where pygmy mammoth bones had been found elsewhere on the island and he realized that highly significant importance of this discovery demonstrating that people were here thirteen thousand years ago - - oops I messed up.

INT: Hang on a second.

R: Yeah.

INT: (Inaudible) hearing that?

INT: I hear it.

R: Phil Orr was the curator of anthropology and paleontology at the Santa Barbara Museum of Natural History and in the 1950's he was doing a lot of work on Santa Rosa Island

not only studying the archeology of the Chumash Indians on the island but also he was interested in the pygmy mammoth bones. There was this pygmy species of mammoth that evolved on the Northern Channel Islands and Phil Orr was interested in that and was gathering fossils that he brought back here to the museum to reconstruct a skeleton of a pygmy mammoth that's on exhibit here to this day at our museum. And Phil was in Arlington Canyon in 1959 and made an accidental discovery.

He found two human femurs protruding from the side wall of Arlington Canyon thirty-seven feet below the existing ground surface. He recognized the sediments in which these femurs were found as being the same formation in which pygmy mammoth bones had been founds and this was a highly significant study because it shows that pygmy mammoths and humans were present at the end of the ice age together on Santa Rosa Island.

INT: Third is a charm. Now after Phil Orr's discovery you subsequently became involved in pursuing and furthering and catalyzing (inaudible) so can you describe where (inaudible) and where you in particular went with this discovery.

R: Okay.

INT: I assume (inaudible).

R: So Phil Orr published his discovery in science magazine and he collected some charcoal nearby the bones which he radiocarbon dated to about ten thousand years ago. So this was a very important discovery at the time. It was an earliest

date that anywhere North America or the presence of humans and we couldn't date the actual bones themselves. Phil could not date the actual bones themselves because in those days radiocarbon dating would have consumed all of the bones and there were problems with bone protein dating. So what Phil Orr did was the smart thing. He wrapped the block of earth containing the bones. He removed it from the sight, the original soil matrix containing the bones, wrapped it in a plaster jacket and removed it here to the mainland where it was stored here at the museum.

Now in 1989, thirty years later, we unwrapped that block of earth and using modern techniques, improved techniques, of radiocarbon dating and bone protein analysis we made the discovery that these bones were actually older than Phil Orr had thought, that they dated back to around thirteen thousand years ago and this is at the end of the place to see on Santa Rosa Island and indeed our dating of pygmy mammoth bones showed that pygmy mammoths were present when the first humans were present on the island.

INT: How significant is this discovery, your dating?

R: Yeah.

INT: And then I'd also like to ask you the story about the back and forth between male and female.

R: The sex change?

INT: Yeah.

R: Yeah. [Giggling.]

INT: Why don't we start with that?

R: Okay.

INT: So you were analyzing the bones and as you got more and more into (inaudible).

R: Yeah, right.

INT: As we were analyzing - - .

R: Okay. Well the significance of the Arlington Spring site on Santa Rosa Island is that it demonstrates that people had watercraft thirteen thousand years ago, that people are using watercraft and this connects with the whole idea of a coastal migration and ancient coastal migration where people would have been using watercraft to work their way from Northeast Asia, around the bearing land bridge in a coastal route of migration fishing and so on using watercraft, and going around glaciers when they encountered them, and working their way down until they came to California.

Now, Arlington Springs man is the oldest dated human skeletal remains in North America or in the Americas period where everyone would agree that it dates to the end of the place to (see). There are very other skeletal remains that have been found that date to this time period.

INT: That was good. Shall we talk about the - - how did we get - - how did you get into a state of uncertainty of whether this was a male femur or female femur.

R: Okay.

INT: And how was that resolved?

R: When Phil Orr originally published the news of the Arlington Springs find he called this individual Arlington Springs Man and when we unwrapped the block of earth containing the bones and actually had a chance to make some measurements on the human femur, the one well preserved human femur, that was there the diameter of the shaft to that femur was quite narrow and to us it seemed like it fell into the range that would indicate that it was a female, not a male after all. And so we began calling the discovery Arlington Spring Woman. Later on I was visited by another anthropologist who is a specialist in biological anthropology and she wanted to see the bones so we take a look at it and she looked at it and she goes, "What makes you think it's a woman?" And I said, "Well we measured the diameter of the shaft of the femur and it falls into the female range." She goes, "Yeah, but, you know, my study show that some of the earliest skeletal remains from the Channel Islands indicate that men had smaller diameter femurs at that time period so I'm not so sure that you're right, that it's a female."

So then I went back and looked in Phil Orr's original writings about the Arlington Springs discovery and I found out that he had measured the head of the femur, the ball - - that goes in the ball and socket joint of the hip and he had

measured that diameter and that portion is no longer in existence. He had sent that to England where it was studied by the leading physical anthropologist at the time, Kenneth Oakley. So we no longer have that piece. It was consumed in an analysis. So what that measurement told us though is that it falls into the male range. The head of the femur falls into the range for most men and thus it's more likely that the Arlington Spring individual was a man not a woman.

So overtime we've had a bit of a gender bender here with regard to the sex of Arlington Springs man. Phil Orr originally thought it was a man, we later on thought it was a woman because of the measurement on the diameter of the femur, but then after we studied his original notes and we actually got the measurement off the head of the femur, a portion of the skeletons no longer exist, we're now back to thinking more likely it's a man so Arlington Springs human has undergone a sex change over time. [Giggling.]

In our studies of the Arlington Spring skeletal remains one of the things I wanted to do was work with the geologist in order to determine exactly where those bones originally were discovered at the sight, wall of Arlington Canyon. So I've been actually working with a team of scientists of geologists and archeologists at this particular location. Our first trip to the island was in the fall of 1993, and we relocated - - it was my first trip to Arlington Springs. We relocated where we

thought the block of earth had originally come from and did some, kind of, exploratory cleaning of the side wall of Arlington Canyon to get a more detailed look at the (straighter) that were exposed in the side wall of the canyon. Subsequently, we went back in 2001 and we terraced the whole side wall of Arlington Canyon to get a really refined look at the sediment layers exposed in the side wall at Canyon.

One of the wonderful things about the Channel Islands is that they're no burrowing animals, there's no gophers, there's no ground squirrels, there are no earthworms, there are no termites, nothing that's turning those deposits and so for an archeologist and a geologist it's just a wonderful record because it's just like a layer cake. You can look at the different (straighter) and really get a refined precise look at changes that have occurred through time.

In 2001 we were studying the layers there at the sidewall of the canyon we made a determination where exactly that block of earth came from by comparing Phil Orr's original photographs, measurements that he had made in the field, his original field map taken all of that information and, you know, pinpointing where the bones originally came from. And we collected a whole bunch of samples for radiocarbon dating the sediments there at Arlington Springs because our dating up to that time had just been on the collegian in the bone, and we wanted an independent way of confirming the age of the bones.

In 2005 we went back with ground penetrating radar and we tried to see what else might exist buried below the surface. We did an experimenting ground penetrating radar.

In 2006 we went back with a drill rig and we punched down these long cores, sediment cores, going down as dip as fifty feet so we were sampling mud dating from almost the last glacier maximum on Santa Rosa Island back maybe as early as eighteen thousand years ago and looking at environmental change through time. Then in a final field season, our sixth field season, in 2006 - - excuse me, 2008, we went back and did a more careful excavation of the layer where Arlington man's bones came from and looking at hopefully - - we were looking for additional artifacts or indications of human presence on the island. Now to date we haven't found very much more than the human bones themselves. However, we did find a number of little tiny (chirp) legs that were resulting of people sharpening their tools at that location thirteen thousand years ago. In fact, we think actually at that time when Arlington man lived it's a little older than what we initially suspected, our radiocarbon dating is telling us that it's dating around thirteen thousand two hundred years ago when Arlington man was on the island.

INT: Two more questions. Do you have plans to go back to the island, Island Springs, for future projects?

R: Oh, yes. We are planning to do some additional survey

work on the islands. We're currently - - maybe I should start over. We have plans for additional work on Santa Rosa Island. We want to do some additional geological and archeological survey work in the vicinity of Arlington Cannon. We also have about thirty more radiocarbon dates that are pending that will help us date the different sediment layers in these core samples. And, once we know where that thirteen thousand year old layer goes in the whole vicinity of Arlington Springs itself we then maybe find areas that are not so deeply buried where it be more easy to do some excavations and explore that ancient land surface.

INT: I have two more questions. Number one could you please state briefly the significance of the (find)?

R: Okay.

INT: I still don't think we've got (inaudible). Its fine about - - through the ice age with the pygmy mammoth. That part was fine.

R: Okay.

INT: But when you say that we radiocarbon dated these to thirteen thousand years ago, it's the oldest known study of human habitation in North America, in fact, all of the Americas then you segway into something like, "And there are few other sites too." Now does that mean that there are some sites that are challenging Arlington Springs? This is not a question - -.

R: Well, you know, you're going to get - - there are,

yeah, there are sights that are even older than Arlington Springs, but they don't have human skeletal remains except for there's human coprolites. Do you know what coprolites are? Feces from a cave in Southern Oregon that are dating fourteen thousand years ago, so we can't say any longer that it's the oldest human remains because we have these - - basically, you know, turds.

INT: Right.

R: You know that are in a cave, but we can say it's the oldest skeletal remains, right.

INT: Maybe then we're okay.

R: Back in 1993 we took small samples from the bone and sent them off to different labs for the latest techniques in radiocarbon dating. I was, at this time, had no idea that these would turn out to be as old as it eventually - - let me start again.

INT: Yeah.

R: Okay.

INT: That's fine.

R: So back in 1992/1993 we took small samples of the femur from Arlington Spring and sent them to different labs that were doing, sort of, the latest state of the art techniques on radiocarbon dating. I didn't have any expectations that they would turn out to be as old as they eventually proved to be. Thomas Stafford who is an expert

chemist and expert in dating very old bones has done some pioneering work in ancient bone protein analysis came here to the museum. He happened to have a conference here on the West Coast or meeting here on the west coast and he stopped by the museum and sat in my office and he says, "John, do you realize you have the oldest dated human skeletal remains in North America?" And this, kind of, was stunning to me because I had no idea. And he said, "It's thirteen thousand years old." So that was my introduction to what a significant find this actually was.

INT: [Clapping.] Very good. And he got your buddy Stafford in there too.

R: I did. [Laughing.] He deserves a lot of credit. I mean, you know, he's amazing.

INT: One of my additional questions, I know you wanted to talk about (inaudible).

R: Well - - okay. Ever since I was young I've been fascinated by the fact that there were people here for thousands of years before my ancestors arrived in North American. And I've wanted to know more about that - - those people, so I think that's what brought me into archeology. I was fortunate when I was in High School to have an opportunity to work on some archeological digs and it was just fascinating for me all the things you could learn from these bits and pieces of the past. It's like a giant puzzle. We're trying to

take little fragments of material culture left behind bones of the fish, and the birds, and the mammals that were being hunted and try to reconstruct all that in telling the story of those people that existed in our region in the past.

I'd like to introduce some of my staff. This is my colleague here in the anthropology department, Jan Timbrook, Dr. Timbrook is curator of Ethnography here at the museum. And over here we have Kaylee Blair and Kaylee is a volunteer here in anthropology at the museum. And over here we have Brian Hogan. Brian is working as a curatorial assistant in anthropology. He's soon to be a graduate student working on his advanced degree in anthropology at one of the University of California campuses and Brian is a Chumash descendent from (inaudible). Ray Corbett over here is our Associate Curator of archeology here at the museum.

[1:12:47 through 1:13:33 no one is speaking during this time.]

INT: John where are we now? Can you explain where we are?

R: This is the collection storage area for the Anthropological Collection at the Natural History Museum here and this particular bank of cabinets are the collections from the Channel Islands. I'm going into a cabinet right here that contains collections from Santa Rosa Island excavated by Phil Orr back in the late 1940's/early 1950's. There's a really interesting collection from a sight on the North Coast of Santa

Rosa Island in this collection in this cabinet. I locked it. There we go.

So we have a number of different things we can talk about here and look at. This tray of artifacts are giant red abalones that come from a sight on the North Coast of Santa Rosa Island dating almost eight thousand years ago. This was a time when the sea temperature was much cooler than it is today and red abalones were up close to shore so people could harvest them in the tide pools. Today in order to fine red abalones you'd have to go down deeper where there's colder water.

INT: Could you just say those are red abalones again?

R: Yes. These are - - most of these shelves in here are red abalone. Here's one black abalone here, but red abalone provide a lot of meat and - - so they're very desirable. But, today in order to find these you have to dive down deep in order to collect them. But at this time period the sea temperature was much cooler than it is today and so people could harvest them from tide pools near shore.

Now moving later in time this is an archeological site or these artifacts are from an archeological site that was occupied within the past two thousand years. This is a bowl carved from a whale vertebrae and one of these you can see here is the parameter are plugged with tar so that it will hold liquid.

Each of these specimens has a catalogue number on it just

like a catalogue number from a book in the library. You can go to the catalogue and you can look up all the information about this particular object, where it was excavated exactly within the site.

Something that may not look that interesting but which is - - actually tells us quite a bit is this old mason jar full of seeds and these are seeds of a plant that ordinarily you wouldn't pay much attention to that grows very close to the ground call Red Maids or scientific is calandrinia. These seeds were harvested in large amounts by Chumash Indians. They were there main grain or seed crop. They're wild seeds but they would be harvested and used for food and also used as food offerings. So the seeds in this jar were found in an abalone shell that had been left as a food offering at this site.

This is also interesting here. This is a barnacle that was found at the site but what's unique about this barnacle is it only grows on the skin of gray whales. So the fact that it's present in the site indicates that they had collected this off the whale that beached nearby on the coast.

Let's see what else we have here. This is an interesting collection of artifacts. Many of the artifacts in this tray are from whales. This is a whale bone that's been worked into what essentially is a pry bar and this was used for popping abalones off the rocks along the coast, it's an abalone pry bar, when they were harvesting abalone. These here are teeth

from a tooth whale probably, in this case, this comes from a killer whale or orca that, again, excavated from a site. Now the Chumash weren't whale hunters but they would take advantage of whales that beached along the coast and use the meat for food and then harvest the bones for making into various kinds of tools.

What we have here is a very interesting piece. This is an abalone shell fishhook that was recovered from this Chumash site. This is carved out of red abalone, in this case, and you'll notice that there's a shank here with a groove on it. That's where the fish line would tie on that shank. Now the tip of the shell fishhook is broken but otherwise it's complete.

This is one of my favorite pieces in the collection from this particular site it's a woven mat harvested from sea grass which can be found in the tide pools along a rocky substrate near the coast. They would harvest this sea grass and use it for skirts for the women, for mats. We'd also make little bags out of it, make cordage out of it, on all the islands, not only the Northern Islands but also the Southern Islands. We find different kinds of fiber work made from sea grass.

INT: Do you have any we can look at?

R: Here's some more examples of sea grass cordage and - - made from the sea grass collected from the tide pools. This over here is quite interesting. This is a spine from a

swordfish that has been sharpened and used as a metal needle for weaving, probably for weaving the sea grass. Okay actually that's not too interesting.

INT: Do you have any beads or shell currency in there?

R: Yeah one of the things - - well I - - one of the things we can show here are the shell beads. The Chumash made an incredibly large number of different types of beads even just the purple olive shell itself they would make an incredible number of different types of beads. These beads though right here are made from the (Pismal) clam shell, clam shell disk beads.

This bead here, this dark colored shell, these are made from muscle shell. And then what we have here is a Chumash bead making kit because remember the islanders were specializing in making shell bead money. So here we have the fractured pieces of the purple olive shell that were being broken up here. Right here we have the disks or the blanks. Before they drilled them they, kind of, shape these into rough chipped disks.

And then here we have examples of the finished shell bead money right here. It's all been strung and besides these, these little slivers of stone, these little micro blades were deliberately manufactured as drills to drill the holes in the shell bead money. And here you have a whole bunch of them, a whole supply of these (bladelet) drills that were used drilling

the holes in the beads.

Now there were on the Eastern Santa Cruz Island there was - - where this (chirp) is found outcropping there were actually quarries where they were digging this out of the stone outcrops and then villages near those quarries were specializing in making the micro drills that would then be traded to other parts of the island where they were producing the bead money.

This, no let's see. This tray here you can see what the remains are that archeologists study. These are pieces of shell. These two trays here are full of fishbone of the fish that were being caught for food and so this is what archeologists sort through. This box here has charcoal in it and so this is what we look at in order to reconstruct the subsistent of the people who lived in the past. And there's a few beads in here these two that were found - - as we're sorting through here as well as some of the stone drills used for drilling the beads in that box right there.

INT: John, could you walk us into the next room now?

R: Yes.

INT: Describe as we go.

R: Okay.

INT: That was excellent by the way and fascinating.

R: Okay. We're now going back to our store room here where we have the heavy ground stone that was - - were used by the Chumash Indians. Actually, what we have here are milling

stones that were used for thousands of years. You're looking at thousands of years of prehistory right here, and they didn't always use the same kinds of milling equipment over time. It changed. One of the interesting things that I see right here is - - . This is a soap stoned cooking pot and what's interesting about this piece is that it was used as a trade item. These were manufactured on Santa Catalina Island and traded to Chumash Indians down here and the name that the Chumash Indians had for Santa Catalina Island was, "Puya" which in their language means soap stones. So the Chumash Indians were calling Santa Catalina Island, "Soap Stone Island" because this is where the soap stone tools were manufactured that were traded to the Chumash for cooking.

INT: Some other examples?

R: Well what else do we have here? Well we've got lots of interesting things in this particular room. Here's something that's quite unusual. This is a stone from one of the Channel Islands. This is actually from Santa Rosa Island and you'll notice that the surface of the stone they pecked it and grooved it here. What they were doing, we think, was this is an anvil stone where they would put the blanks, the shell bead blanks, in these little pits and then this is where they would drill the holes in the shell beads being held in the pits in the stone. We're going to go look at the exhibit that we have in the hallway over here too - - talk more about Arlington

Springs.

INT: Could you also tell us about all the collections you have in here John?

R: Oh, yeah.

INT: Just to me as we walk.

R: Okay. This room contains thirteen thousand years of prehistoric human occupation here in the Santa Barbara region. Some of the type collections for defining prehistory in our area are contained in these cabinets. So this lab is where science happens here at the Museum of Natural History in the anthropology department. This is where we do most of our work.

INT: What are some of the current projects?

R: Oh we're working on several different projects. At the moment we're cataloguing some material. We also just recently received an important collection from the (Criama) Valley and we're - - perishable items that were found in caves back in the mountains - - document what basketry and other things look like that normally don't survive in an archeological context. These refrigerators contain all of those sediment cores from Arlington Springs, so we have them stored in these three refrigerators here.

So this poster here is the way that we are looking at visually the up to eighteen thousand years of geological history on Santa Rosa Island and archeological history.

This poster was created to - - out of photographs we took

of each segment of these sediment cores out on Santa Rosa Island at Arlington Springs. Each core, you could see there's six cores pictured on this poster, each one is started from the existing ground surface. So these are all calibrated accurately to their correct elevation above sea level, and so this is the ground surface and I'm walking back in time here. So as I go along this poster I'm going back in time and when we reach here, right here, this is a - - you can see pieces of shell shown in this particular core. This is a shell midden eight thousand years ago almost eight thousand years ago where people were living on Santa Rosa Island and collecting those red abalone shells that were then left behind. And it's so dark because of all the charcoal from their fires that is mixed into the soil.

Now on the lower level here we have, again, a radiocarbon date. We radiocarbon dated this particular shell midden here. You'll also see in these two cores these are all part of the same - - these cores are fairly - - located fairly close to each other. These are also showing that there was a shell midden but right here in these two cores you can see there's a sand layer. So people were living here, they abandoned the area, there was sand that blew in, and then they came back and lived at the same location. Wherever you see these little arrow points shown on the map these are samples that we've taken from the cores that we're going to be getting a

radiocarbon date. So, again, we're going to have thirty radiocarbon dates additional to what we now know right now that's going to help us date the different sediment layers in the cores.

I continue walking back through time here and I now reach a time about, well, twelve thousand eight hundred years ago, you'll see there's another black layer here and this is a period of time right at the end of the ice age when things got suddenly cold again. This particular black layer that you see here is found all over North America at this particular time period. There's another whole story connected with this black layer. It may be so black it appears to be that it is so black because of accumulation of charcoal and soot from widespread burning that occurred, and the most recent information from a number of geological studies is that North America and the Northern Hemisphere were impacted by a comet that struck North American and this caused widespread burning and created the black layer that we see all over the continent.

So we get back here to around twelve thousand eight hundred years and then a little bit earlier here is the layer where Arlington Mans bones were discovered right around thirteen thousand two hundred years ago. Okay, so - - .

As I walk along this poster here what I'm doing is walking back through many centuries, actually many thousands of years, and right here is the layer where Arlington Spring man's bones

were discovered thirteen thousand years ago. So we have thirteen thousand years of prehistory right here in this segment of the poster but what's interesting is this is only half of the story. And if I go around here to the rest of the poster we have another several thousand years represented. What we've discovered actually in our radiocarbon dating so far is that these two cores that you see right here that sedimentation was very rapid, that all of that sediment accumulated in a thousand years whereas an equivalent amount of sediment accumulated in thirteen thousand years for the rest of prehistory. So what's going here? Why was the landscape changing so rapidly during this particular millennium? It's because of sea level rise. When the sea level is rapidly rising as it was at the end of the ice age that's because the glaciers were melting in the artic. And, so the sea level was rising rapidly during that particular millennium and when sea level rises it forces sediment accumulation on land. So this is why we have, we think, so much accumulation just within a thousand years and equivalent amount as what happened the remaining thirteen thousand years.

What we're looking at here is the grounds surface at each of these locations where we took a core all calibrated to their correct elevation above sea level and now we're walking back in time as we go deeper into each core and we have radiocarbon dates down on this lower level. So here we're almost eight

thousand years in the past. We keep going deeper and deeper back in time and we get back to here which is about twelve thousand nine hundred years ago right here and then even older is this layer right here, the Arlington man layer, where Arlington man's bones were recovered dating at about thirteen thousand two hundred years. This is only half of the story. The other half of the story is when we round the corner and we have an equal depth shown here and what's interesting is up to this point we have thirteen thousand years ago - - if we go on these two cores here back in time that's only another thousand years when we get to the bottom of these cores.

So a lot of sediment accumulated within a millennium, you know, what's going on? You know what's the story here? Well we know believe that this accumulation of settlement is telling us a story of what the sea level is doing, that this last thousand years where this - - before we get to Arlington man's time the sea level was rising rapidly and when sea level rises rapidly it forces sediment accumulation on land to keep pace with the new changing level of the sea. That's what we're seeing here in this poster is this rapidly changing situation where the glaciers are melting and the artic and sea level is rapidly rising.

INT: As long as you're here can you point out what's going in these pictures here?

R: Yeah, yeah, sure. Okay.

INT: We're ready.

R: Ready? Okay. This is a photograph taken in 1960 soon after the discovery of the Arlington Springs bones. In fact, right here on this platform the bones are still in place there, have not been removed from the site. So this gives you an idea that these bones were buried thirty seven feet below the ground surface. Here's a person standing up there at the top.

Now this photograph over here was taken in 2001 during our research when we went in there and we cleaned up the side wall of Arlington Canyon. And here you can see visually this wonderful layer cake effect here. Each of these dark layers is full of charcoal or carbon. Some of these, the dark layers, are the result of a lot of organic material mixed in, others are the result of maybe a wild fire or something that swept through here leaving behind this black layer. Right here this particular location outlined in string that's the layer in which Arlington man's bones originally was discovered. And, above that layer you see here's that black layer at the end of the ice age that you find all over North America right here. And what you also see is this is actually the bottom of an ancient slope here. So this was a - - there was a stream channel that came through here and then all of this over time filled up with sediment and filled in that valley that used tc exist at that location.

Right here we have a picture of our crew back in 2006.

You can see we're all standing around this drill rig that is what produced these sediments cores that we've been discussing and what is shown on that big long poster that we have. Then this is our crew in 2008, our last field season at Arlington Springs, and some of the important people shown in this picture - - they're all important but this is my colleague Thomas Stafford who does the radiocarbon dating of all of our samples from Arlington Springs, is a world renown expert on dating ancient bone.

This is Doctor Jim West who is also an archeologist and specializes in geology at archeological sites. This is Mr. Schott Newhall who has funded a lot of our work on Santa Rosa Island, Dr. Carl Hutter who is the Executive Director of our Museum, Don Morris who is the head archeologist for Channel Islands National Park for many years, Gilbert (Vensweta) who is a Chumash descendant who worked with us on this project. And, again, these are three of the most important people I've worked with. Dr. Thomas Stafford show here who is an expert chemist and geologist and has pioneered techniques in radiocarbon dating. Dr. Carl Hutter who is Executive Director of our museum at the time of this work, and Mr. Scott Newhall who's funded a lot of our work at Arlington Springs.

And in this photograph here this is taken back in 2001 and what we're doing is taking pictures from the same locations where Phil Orr took his pictures, so we could compare Phil

Orr's photographs with the ones that we took. This is a news press photographer who happened to be out there at the site at the time and helped us out with taking some pictures using the same kind of lens that Phil Orr had used on his camera. And this is Doug Hector who has helped us with a lot of the visualization comparing these old photographs, and Doug is the one who produced the poster that I showed here more recently of the sediment cores.

INT: That's beautiful. Thank you very much. That's good. That's great.

END OF INTERVIEW